Claim 8, line 1, change "6" to --7--.

REMARKS

In the Office Action, the Examiner rejected claims 1, 2, 6, 11 and 12 under 35 U.S.C. §102 as being fully anticipated by both U.S. Patent 5,699,392 (Dokic) and a paper "RFC 1305 Network Time Protocol (Version 3)," (Mills). Claim 8 was rejected under 35 U.S.C. §112 as being indefinite. The Examiner objected to Claims 3-5, 7, 9 and 10 as being dependent upon a rejected base claim, and the Examiner indicated that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Examiner also objected to informalities in the specification, the drawings and the Abstract.

In response to the Office Action, Claim 1 is being amended to emphasize differences between the claim and the prior art, and Claim 8 is being amended to be dependent from Claim 7. Also, amendments are herein being made to the specification, and a corrected set of drawings are being submitted.

The new, corrected set of drawings have been prepared to address the Examiner's objections to the original drawings, care being taken to avoid adding new matter. The new drawings are substantially identical to the original drawings, and the changes between the corrected Figures and

the original, corresponding Figures are shown in red in the new Figures. The principal differences between the corrected and the original drawings are that, in the new drawings, Figures 1-4 are labeled "prior art," and the new figures include reference numbers to identify various elements and steps shown in the drawings. In addition, as the Examiner may be aware, the original set of drawings contained the same figure twice, once on sheet 8 and once on sheet 9, and the corrected set of drawings include this Figure only once. The Examiner is respectfully requested to enter the new set of drawings, and to reconsider and to withdraw the objections to the drawings.

Applicant's Attorneys have also carefully reviewed the entire specification, and this opportunity is being taken to correct the typographic and editorial errors that were noted by the Examiner, as well as additional minor errors, and to add the reference numbers included in the corrected drawings, again care being taken to avoid adding new matter. In view of these corrections, the Examiner is requested to reconsider and to withdraw the objections to the specification and to the Abstract.

Claim 8, as mentioned above, is herein being amended to be dependent from Claim 7, which provides the appropriate antecedent basis for the term "the threshold" in claim 8. In view of this amendment, the Examiner is requested to

reconsider and to withdraw the rejection of Claim 8 under 35 U.S.C. §112.

With respect to the rejection of Claims 1-2, 6, 11 and 12 over the prior art, it is important to recognize that the problem solved by the system disclosed in Mills is quite different from the problem presented by MPEG-2 clock recovery. In an MPEG-2 system, failure to adjust the local clock causes the system to repeat data (audio or video) or causes data (audio or video) to be lost. Another difference is that for the problem solved by NTP, an acceptable accuracy is measured in seconds while for an MPEG-2 system the acceptable accuracy is 300 ticks of an ideal 27MHz clock (8.1 milliseconds). It may not even be possible to implement the required MPEG-2 clock recovery mechanism using a general purpose computer as suggested in the statement from the Examiner.

All of the prior art that the inventor is aware of requires specialized hardware to capture the timestamps in the incoming MPEG-2 transport stream, and either hardware or a processor running a real-time operating system to make adjustments quickly enough to have an effect on the local clock before the next timestamp arrives. Specialized hardware is also required generating the local 27MHz clock.

To the best of Applicant's knowledge, there is no working implementation of a general purpose computer parsing an MPEG-2 transport stream and performing clock recovery. If

the Examiner is aware of such an implementation, the Examiner is respectfully invited to point out that implementation.

With regard to Dokic, Applicant respectfully submits that the Examiner's statement that Dokic's solution determines the difference between the local and remote clock frequencies is not correct. Dokic does not explicitly determine the frequencies of either the local or remote clocks. At most, Dokic computes the difference between counts maintained at the local and remote locations (the MPEG-2 transport stream only carries the count of the remote system in the PCR). The difference between PCR and STC does not provide information about the frequencies of the local and remote clocks, but only about the relative magnitudes of their respective counters. Another complication in computing the frequencies is that the period between PCRs arriving in the MPEG-2 transport stream is not fixed. There is only a maximum period between any two PCRs which is specified. Dokic does not claim that the differences approach zero, as indicated by the Patent Office. The claim is that they are close, and he explicitly drops the 9 LSb of the S.C. in his computation in the divide by 300 counter. At best, in Dokic's solution, the local and remote counts approach 300.

The present invention, as defined by claims 1, 6 and 11, adds an important element to the clock recovery techniques which can be used for MPEG-2 systems. Specifically, the invention computes not only the difference in between the PCR

and S.C., but also the frequency difference between the remote and local clocks. This invention maintains the prior S.C. and PCR values, which, with the next S.C. and PCR values, can be used to determine the frequencies of the local and remote clocks.

This solves a problem faced in prior solutions such as Dokics, in that if the feedback gain is turned up high in an effort to quickly match the PCR and S.C. values, the local clock will be running too fast or slow with respect to the remote clock and the S.C. will overshoot or undershoot the PCR. This causes the system to oscillate, and may cause the magnitude of the difference between the S.C. and PCR to quickly exceed an acceptable limit. The present invention not only monitors the difference between the PCR and S.C., but also the difference in frequencies between the local and remote clocks. Using both of these values, the feedback control loop quickly brings both of the differences closer to 0. An important, advantage is that this invention locks the local clock to the remote clock much sooner than the prior art.

Because of the above-discussed differences between Claims 1, 6 and 11, and because of the advantages associated with those difference, claims 1, 6 and 11 patentably distinguish over the prior art and are allowable. Claims 2-5 are dependent from Claim 1 and are allowable therewith, Claims 7-10 are dependent from Claim 6 and are allowable therewith,

and Claim 12 is dependent from, and is allowable with, Claim 11. Accordingly, the Examiner is respectfully requested to reconsider and to withdraw the rejections of claims 1, 2. 6. 11 and 12, and the objections to Claims 3-5 and 7-10, and to allow Claims 1-12.

For the reasons advanced above, the Examiner is requested to reconsider and to withdraw the objections to the specification, the drawings, and the Abstract. The Examiner is also requested to reconsider and to withdraw the rejections of Claims 1, 2, 6, 11 and 12 under 35 U.S.C. §102, the rejection of Claim 8 under 35 U.S.C. §112, and the objections to Claims 3-5, 7, 9 and 10, and to allow Claims 1-12. If the Examiner believes that a telephone conference with Applicant's Attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Respectfully submitted,

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